Clean Air Status and Trends Network (CASTNET)
Concerns for Konza Prairie Regulatory Ozone Monitoring
Briefing Document
March 22, 2013

Konza CASTNET Location

In 2002, EPA (CAMD) coordinated with the Nature Conservancy and Kansas State University to locate and operate a CASTNET site on the Konza Prairie Preserve.

The Purpose of the CASTNET Network is to:

- Monitor the status and trends in regional air quality and atmospheric deposition
- Provide information about complex atmospheric chemistry in rural areas
- Provide information on the contribution of atmospheric pollution to ecosystem conditions
- Provide measurements for validating and improving atmospheric models

The 8,600-acre Konza Prairie Preserve, located in the Flint Hills region of northeastern Kansas, is owned by The Nature Conservancy and operated by Kansas State University as a field research station. The site is also a member of the NSF Long-Term Ecological Research (LTER) program.

Located 3 miles outside Manhattan MSA (Pop. 134,000); 10 miles south-southwest of city of Manhattan (Pop. 54,000);Riley County (Pop. 70,000)

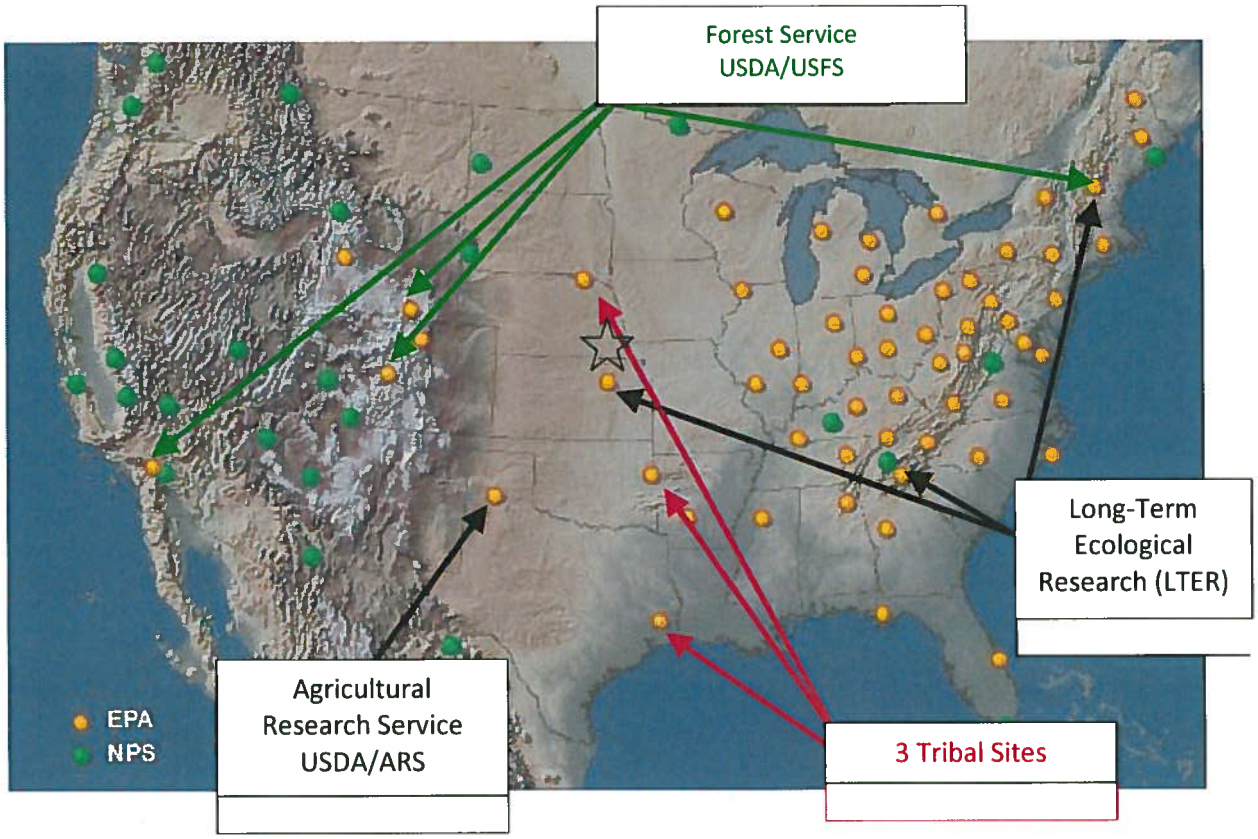
Important Dates

a. Began as CASTNET site 03/26/2002
b. Became regulatory monitor 01/01/2011
c. KS Ozone season April 1 – October 31

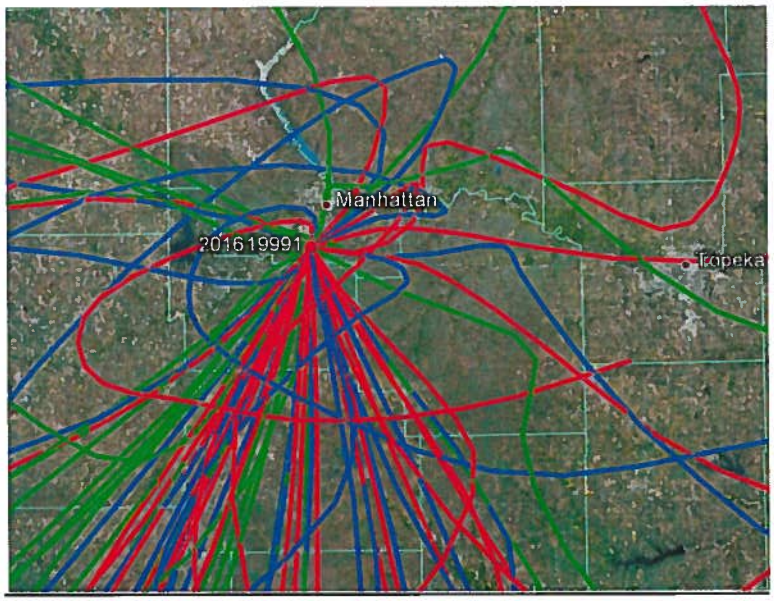
Ozone Status

1) Only 2 years of data have been collected at this monitor as compliant status
   a. While a design value can be calculated for the 2 year period, compliance determination with the ozone NAAQS requires 3 years of data. Currently the monitor is not showing violations for designation purposes. Design values (3-year average of 4th highest daily max; Compare to 2008 NAAQS of 75 ppb)
      i. 2009-2011: 68 ppb (1 year regulatory)
      ii. 2010-2012: 72 ppb (2 years regulatory)
      iii. 2011-2013 will be first complete 3-year period for attainment determination
         1. The county could not be designated non-attainment unless fourth highest daily value in 2013 is 80 ppb or higher.
         2. If KS granted exceptional event days, the design value would be ???

2) **CASTNET SITES: 83 Sites in 44 states/provinces**



3) **Analysis of Trajectories (HYSPLIT trajectories for exceedance days with no burn on that day or the previous day.)**



State/Local's Concern for Compliance Use of Konza Prairie CASTNET Monitor

1) KDHE believes the KNZ184 CASTNET monitor is not properly sited to collect ozone data for regulatory purposes given
    a. the research fires conducted at that site and their propensity to generate localized emissions,
    b. the initial purpose of the monitor as a research site (ecosystem assessment) conflicts with its use as a compliance monitor,
    c. the site does not represent population exposure, and
    d. the site is duplicative of a better, transport site
2) KDHE is concerned about the lack of communication with KDHE during the transition of the monitor to a compliance monitor. KDHE was not notified that the monitor had been upgraded to a compliance monitor until 2012.
3) The Monitor is located in Riley County, which is primarily rural and agriculturally based. There is little to no local industry for reduction of emissions to apply ozone precursor controls.
4) State agencies have the responsibility, according to the Exceptional Events Rule, to demonstrate to their EPA region that an exceptional event occurred and should be flagged. Given the frequency of research burns it would be a time consuming and a costly endeavor for KDHE's 3-person staff to develop Exceptional Event demonstration packages for each potential episode. The state would however plan to submit an Exceptional Event Request for 4 elevated ozone days in 2011.
5) This rural monitor is strongly influenced by interstate transport through most of the ozone season and any future non-attainment designations would result in little or no substantial human health or environmental improvement.
6) If future monitoring needs result in use of the CASTNET sites for the PM NAAQS, this site could potentially be elevated as contributing to "Ag Dust".
7) The Konza Prairie is divided into 50 watershed units, each subjected to a specific combination of research-oriented prescribed burning regimes. Kansas State University has been conducting experimental burning at this site since 1972. These burn regimes include varying burn frequencies of 1, 2, 3, 4, 10, or 20 year intervals, during the Spring, Summer and Fall months. The CASTNET site is surrounded by these experimental burn plots.
8) Because of its proximity to rangeland fires, this site does not represent a good transport site for ozone. The Cedar Bluffs site serves that purpose.

Options that have been discussed between Region 7, OAQPS, CAMD and KDHE

Continuing the monitoring for all pollutants is preferable so long as the monitoring is done consistent with the stated purpose for CASTNET.

1) Classify the monitor as a non-regulatory ozone monitor using 40 CFR Part 58 as discussed below for a justification. Continue to report data to AirNow for research purposes. . Data would be used in AIRNow, but not used for design value calculations or designations. Historically we have only used this flag for high elevation sites (Whiteface Mountain); we would have to justify non-regulatory justification and we could get challenged on this decision. Basis for status could be unique in that the site does not meet 40 CFR Part 58, App. E Section 2.2.

(According to 40 CFR Part 58, Appendix E, Section 2.2. "Spacing from Minor Sources" (Applicable to SO2 and O3 Monitoring Only)...*the probe or at least 90 percent of the monitoring path must be away from furnace or incineration flues or other minor sources of SO2 or NO, particularly for open path analyzers because of their potential for greater exposure over the area covered by the monitoring path. The separation distance should take into account the heights of the flues, type of waste or fuel burned, and the sulfur content of the fuel.*)

2) Discontinue Ozone monitoring at the site. There is currently no regulatory requirement for this monitor to be fielded. If a future proposal requires a monitor for population areas of greater than 50,000, KDHE would propose an alternative site in the future.

3) Move compliance ozone monitoring to a more suitable, representative site in the near future-likely within the closest population center of Manhattan, KS. This would involve grant/budget discussions with State because it would no longer be CASTNET.

4) Leave the site as is-status quo. (May risk losing part or entire monitoring site.) Received email from Nature Conservancy stating concerns.

2013 Kansas Ozone Monitoring Sites